REMARKS

Claims 1-44 are pending in this application. Claims 1, 3-19 and 37-41 have been allowed. By this amendment, claim 20 has been amended. Reconsideration and allowance in view of the following remarks are respectfully requested.

Claims 20, 22, 26, 28, 31-36 and 43-44 are rejected under 35 U.S.C. §103(a) as being unpatentable over Appelt *et al.* (US 5,900, 675, hereinafter "Appelt") in view of Lee (US 6,050,832).

Claims 23-25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Appelt in view of Lee in further view of Nguyen (US 5,477,933).

Claim 27 is rejected under 35 U.S.C. §103(a) as being unpatentable over Appelt in view of Lee in further view of Distefano (US 6,309,915 B1).

Claims 29-30 and 42 are rejected under 35 U.S.C. §103(a) as being unpatentable over Appelt in view of Lee in further view of Sheppard (US 6,284,569 B1).

Applicants respectfully traverse the §103(a) rejections with the following arguments.

35 U.S.C. § 103(a)

Claims 20, 31 and 43

The Examiner alleges that "Appelt teaches a connector system comprising a first substrate 620 of a first coefficient of thermal expansion, a second substrate 630 of a second coefficient of thermal expansion, a flexible connector 610/640, at least three contacts 612, 613 formed on a first surface of the substrate, and at least three contacts 631-634 formed on a second surface of the substrate, wherein select contacts on the first surface if the substrate are alternatingly offset from select contacts on the second surface of the substrate, where the coefficient of thermal

expansion of the connector is midway between the first and second coefficient of thermal expansion of the first and second substrates, respectively." "Appelt does not explicitly teach at least three alternatingly offset contacts from a neutral point. Lee teaches an apparatus comprising a first substrate 14, a second substrate 10, a flexible connector 218 attached between the first and second substrates by a plurality of contacts on a first and second surface of the connector, wherein all of the contacts on the first and second surfaces alternate with respect to each other. This statement of 'all of the contacts' would encompass the limitation of 'at least three contacts' and also the limitation of 'at least three contacts in succession'." "Lee teaches the general principle of alternating contacts in order to reduce stress within a multiple substrate and connector arrangement". "It would have been obvious ... to provide additional contacts to the Appelt reference arranged in an offsetting manner to further reduce thermal expansion with the substrates."

Applicants respectfully contend that claims 20, 31 and 43 are not unpatentable over Appelt in view of Lee, because Appelt and Lee, individually or in combination, do not teach or suggest each and every feature of claims 20, 31 and 43. For example, Appelt and Lee do not teach or suggest at least three contacts on a second surface of the substrate, wherein the at least three contacts on the first surface of the substrate are alternatingly off-set from the at least three contacts on the second surface of the substrate, as required by claim 20. Similarly, Appelt and Lee do not teach or suggest a flexible connector having a core surrounded by a compliant material, and a plurality of alternating contacts on a first surface and a second surface of the flexible connector, wherein at least three contacts in succession on the first surface alternate with at least three contacts in succession on the second surface, as required by claim 31. Likewise,

Appelt and Lee do not teach or suggest at least three contacts located at a far distance to a neutral point (DNP) on a first surface and at least three contacts located at a far distance to a neutral point (DNP) on a second surface of the substrate, wherein the contacts are off-set, as required by claim 43.

As clearly illustrated, in Fig. 6 of Appelt, the contacts 631-634 on a first surface of the chip carrier 610 do not alternate with respect to, nor are they off-set from, the contacts 612-613 on a second surface of the chip carrier. Applicants further assert that the Office's combination of Appelt and Lee fails to remedy this deficiency. Lee's design, utilizing a segmented interposer 118 having alternating solder balls 12 and 16, encourages movement of the various decoupled segments of the interposer 118, (see, col. 5, lns. 32-36; lns. 43-45). This is in direct opposition to Appelt, which is designed to prevent or "restrain" movement of the chip carrier 610 in the region of the chip 630, (see, col.4, lns.15-23, emphasis added). In fact, Appelt specifically states that the chip carrier 610 has different CTE values in the x-y plane in order to minimize warping, (see, col. 3, lns. 10-22). Accordingly, there would be no motivation to utilize the off-set contacts of Lee, which are intended to encourage movement of the interposer 118, with the chip carrier 610 having reinforcement 640 of Appelt, which is intended to prevent or "restrain" movement.

Based on the preceding arguments, Applicants respectfully maintain that claims 20, 31 and 43 are not unpatentable over Appelt and Lee, and that claims 20, 31 and 43 are in condition for allowance. Since claims 22-30 and 44 depend from claim 20, and claims 32-36 depend from claim 31, Applicants contend that claims 22-30, 32-36 and 44 are likewise in condition for allowance.

Claim 42

The Examiner concedes that "the combination of Appelt and Lee does not teach a stiffener frame." But further alleges that "Sheppard teaches a stiffener frame 100 providing stiffening for an integrated circuit package further comprising a stiffener frame that is attached to and surrounds the perimeter of a substrate or connector, wherein the stiffener is adhesively or removably attached to the substrate, wherein the stiffener frame comprises a material selected from the group consisting of: plastic, metal, and ceramic." And that "[i]t would have been obvious to a person skilled in the art to include a stiffener frame to the Appelt/Lee combination in a manner to not only insure a more rigid and secure electronic device, but also to act as a heat sink".

Applicants respectfully contend that claim 42 is not unpatentable over Appelt in view of Lee, in further view of Sheppard, because Appelt, Lee and Sheppard, individually or in combination, do not teach or suggest each and every feature of claim 42. First, Applicants assert that the arguments above are equally applicable to claim 42 with regard to the inappropriateness of combining Appelt and Lee. In addition, Appelt, Lee and Sheppard do not teach or suggest a stiffener frame surrounding a perimeter edge of the flexible connector, as required by claim 42.

In contrast, Sheppard teaches a carrier ring 100 attached to a first surface of a matrix substrate 501, in a manner illustrated in Fig. 5. As can clearly be seen, the carrier ring 100 is not **surrounding a perimeter edge** of the matrix substrate 501. In fact, the carrier ring 100 of Sheppard is only proximate a first surface of the substrate 501, not a perimeter edge of the substrate 501. The carrier ring 100 of Sheppard does not even contact the "edge" of the substrate

501, much less surround the perimeter edge. Furthermore, there is no reason to combine Appelt, Lee and Sheppard to teach a stiffener frame surrounding a perimeter of the connector.

Based on the preceding arguments, Appellants respectfully maintain that claim 42 is not unpatentable over Appelt in view of Lee in further view of Sheppard, and that claim 42 is in condition for allowance.

CONCLUSION

Applicants respectfully request withdrawal of all rejections and submit that the entire application is in condition for allowance. However, should the Examiner believe anything further is necessary in order to place the application in better condition for allowance, or if the Examiner believes that a telephone interview would be advantageous to resolve the issues presented, the Examiner is invited to contact the Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

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